

REMARKS

The present invention provides dihydropyrazolo[3,4-d]thieno[2,3-b]pyridinone compounds of formula I, and the therapeutic use thereof for the treatment of an immune disorder related to or affected by the immune regulatory protein B7-1.

Claims 1-20 are pending in this application. Claims 1, 9, 10, 15 and 20 have been amended.

Claims 1-20 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Examiner feels that in independent claims 1, 10, 15 and 20 the values of the variables R₃, R₄, and R₆-R₂₇ defined as "heteroaryl" and "C₅-C₇cycloheteroalkyl" are indefinite. Examiner also feels the term "stereoisomers" is indefinite.

Applicants have amended claims 1, 10, 15 and 20 to more clearly point out and distinctly define the terms "heteroaryl" and "C₅-C₇cycloheteroalkyl". Support for this amendment is found in the specification on page 7, lines 22-24 and lines 14-16, respectively. The term "stereoisomers" is clearly defined in the specification on page 9, lines 1-10. However, while not implying any agreement with Examiner's rejection and in order to advance prosecution, applicants have amended claims 1, 9, 10 and 15, in the manner suggested by Examiner, to delete the term "stereoisomers". In view of the above amendments, Applicants believe the rejection under 35 U.S.C. §112, second paragraph has been overcome.


Claims 1-7 and 15-20 have been rejected under 35 U.S.C. § 103(a) as being obvious in view of Forbes, J. Med. Chem. 1990, Vol. 33, 2640-2645. Examiner states Forbes compound 5d differs from the instant compounds by having a hydrogen atom as variable R in place of a phenyl group (variable R₄ in the instant compounds). Examiner also alleges that Forbes teaches the interchangeability of the variable R to be either a hydrogen atom or a phenyl group and that, therefore, one would be motivated to prepare the instant compounds by modifying compound 5d, disclosed by Forbes, without affecting the utility. Further, Examiner feels the process of instant claim 20 would have been obvious from the teachings of Forbes.

Applicants respectfully traverse the rejection. Forbes compound 5d is a fused thieno[2,3-b]pyridine ring system wherein the carbon atom adjacent to the pyridyl nitrogen is unsubstituted (R = H). Forbes compound 5a is a fused thieno[3,2-b]pyridine ring system, i.e. the "flipped" thienopyridine of compound 5d, wherein the carbon atom adjacent to the pyridyl nitrogen is substituted with a phenyl group (R = phenyl). Forbes does not teach the interchangeability of a hydrogen atom with a phenyl group within a single fused thieno [2,3-b]pyridine ring system. In sharp contrast, the 5a and 5d compounds of Forbes are two distinct fused ring systems and one of ordinary skill in the art would not consider the substitutions taught by Forbes to be interchangeable. The modification of compound 5a to compound 5d actually involves two changes, adding the phenyl group and "flipping" the

thiophene ring. Further, in sharp contrast to Examiner's allegation that one skilled in the art would have been motivated to prepare the instant compounds having a phenyl group for the variable R by modifying the compound 5d disclosed by Forbes without affecting their utility of anxiolytic activity, Forbes teaches that substitution at the 4-position by phenyl (compound 5a) caused a dramatic reduction in the *in vitro* affinity for the BZ receptors (K_i 1000nM), i.e. the utility was affected significantly in a negative manner. One skilled in the art would not look to the teachings of Forbes (anxiolytic agents) to design an immunogenic agent and, in particular, one would not design the compounds of the instant invention based on the teachings of Forbes that the substitution by a phenyl group on the carbon atom adjacent to the pyridyl nitrogen leads to a dramatic reduction in biological activity. Clearly, the instant compounds, and their surprising immunogenic efficacy, are neither predicted nor taught by Forbes and are unobvious in view of the teachings of Forbes. Correspondingly, the process of claim 20 would not be rendered obvious by the teachings of Forbes, since Forbes does not teach or predict the specific unique compounds prepared by the process of claim 20.

In conclusion, Applicants believe that Examiner's rejections under 35 U.S.C. § 112, second paragraph, and 35 U.S.C. § 103(a) have been overcome in view of the foregoing remarks and in view of the amendments to the claims, as shown hereinabove. Applicants respectfully request the Examiner to enter the above amendments, consider the above remarks, withdraw the rejections and allow the application.

Respectfully submitted,



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